Dwie Saptarani (2018). Kemampuan Guru Biologi Mengintegrasikan STEM dalam *Pedagogical Content Knowledge* (PCK) dan Dampaknya terhadap Kemampuan *Engineering Design Process* Siswa SMA.

ABSTRAK

Pembelajaran STEM dikembangkan untuk mempersiapkan siswa menjadi masyarakat ilmiah dan berteknologi maju. Salah satu indicator keberhasilan STEM adalah munculnya kemampuan *engineering design process* pada siswa. Guru harus mulai peka untuk mengambil peran dalam pembelajaran STEM, karena kesuksesan STEM tidak hanya dilihat dari hasil belajar siswa, tetapi bagaimana guru membawakan STEM menjadi pembelajaran yang bermakna. *Pedagogical Content Knowledge* (PCK) tentang STEM perlu benar-benar dikuasi oleh guru. PCK merupakan kemampuan bagaimana membelajarkan konten tertentu dengan cara tertentu yang harus dimiliki oleh guru untuk dapat meningkatkan pemahaman siswa. Seiring dengan berjalannya waktu dan pengalaman, semestinya kemampuan PCK guru dapat meningkat. Penelitian kualitatif ini menggunakan metode studi kasus yang melibatkan seorang guru Biologi SMA, dan sekitar 20 orang siswa yang diampu oleh guru tersebut. Guru sebagai subjek penelitian juga dilibatkan dalam pelatihan mengenai STEM, dan PCK, yang kemudian hasil pelatihan diimplementasikan dalam kegiatan *lesson study*. Data diperoleh berdasarkan respon guru terhadap kuesioner CoRe yang diambil secara berkala sebelum pelatihan dan setelah pelatihan, kemudian CoRe dan PaP-eRs setelah *lesson study*. Hasil yang diperoleh menunjukkan bahwa kemampuan guru dalam mengintegrasikan STEM dalam PCK masih rendah, dan meningkat seiring dengan dilaksanakannya pelatihan dan *lesson study*. Adapun kemampuan guru dalam mengintegrasikan STEM dalam PCK sebelum pelatihan berada pada level *pra* PCK dan growing *PCK*, setelah pelatihan pada level *growing* PCK, dan setelah *lesson study* berada pada level *growing* PCK dan *maturing* PCK. Selain itu untuk melihat keberhasilan STEM dari sudut pandang siswa, didapatkan hasil bahwa setelah melaksanakan pembelajaran STEM kemampuan *engineering design process* pada siswa, kemampuan pikir berada pada level pemula, berkembang, dan lanjutan. Sedangkan kemampuan desain berada pada level tumbuh. Kemampuan buat atau eksperimen berada pada level berkembang, dan kemampuan uji atau refleksi juga berada pada level berkembang.

Kata Kunci : PCK, STEM, Kemampuan *Engineering Design Process*

Dwie Saptarani (2018). Ability of Biology Teachers to Integrate STEM in PCK and Its Impact on Students' Engineering Design Process Ability in Senior High School.

ABSTRACT

STEM learning was developed to prepare students to become a scientific and technologically advanced society. One indicator of the success of STEM is the emergence of the ability of engineering design processes in students. Teachers must begin to be sensitive to take part in STEM learning, because the success of STEM is not only seen from student learning outcomes, but how teachers bring STEM into meaningful learning. Pedagogical Content Knowledge (PCK) about STEM needs to be thoroughly controlled by the teacher. PCK is the ability to teach certain content in a certain way that must be owned by the teacher to be able to improve student understanding. As time and experience progress, the ability of the teacher's PCK can increase. This qualitative study uses a case study method involving a high school biology teacher, and about 20 students are taught by the teacher. The teacher as the research subject was also involved in training on STEM, and PCK, which later the training results were implemented in lesson study activities. Data was obtained based on the teacher's response to the CoRe questionnaire which was taken periodically before training and after training, then CoRe and PaP-eRs after lesson study. The results obtained indicate that the teacher's ability to integrate STEM in PCK is still low, and increases with the implementation of training and lesson study. There is a teacher's ability to integrate STEM in PCK before training at pre PCK levels and growing PCK, after training at level growing PCK, and after lesson study is at the level of growing PCK and maturing PCK. In addition to seeing the success of STEM from the student's point of view, it was found that after carrying out STEM learning the ability of engineering design process in students, thinking ability was at the beginner level, developing, and continued. While design capabilities are at a growing level. The ability to make or experiment is at a developing level, and the ability to test or reflect is also at a developing level.

Keyword : PCK, STEM, *Engineering Design Process Ability*